Request for Information (RFI)

State of Alaska
Department of Transportation & Public Facilities
Division of Administrative Services

Date Issued: October 11, 2024

RFI #2525H032 ALASKA INTERNATIONAL AIRPORT SYSTEM PHOTOVOLTAIC (PV) ARRAY INSTALLATION PROJECT

Introduction:

The Alaska Department of Transportation & Public Facilities (DOT&PF) is issuing this Request for Information (RFI) to solicit detailed subject matter information from qualified companies for the design, installation, and operation of photovoltaic (PV) systems at Ted Stevens Anchorage International Airport (TSAIA) and Fairbanks International Airport (FIA). These projects will focus on reducing energy costs and enhancing sustainability through PV systems and battery storage solutions. Information submission/submittals should include technical designs, financial models, and implementation strategies.

The purpose of this RFI is to solicit comprehensive submittals that detail the technical approach, system design, financial models, and operational strategies for implementing solar photovoltaic systems at TSAIA and FIA. The information provided will form the basis for developing a Request for Proposals for the installation a PV system that meets the airports' energy efficiency and sustainability goals.

Background Information:

Both Fairbanks International Airport (FIA) and Ted Stevens Anchorage International Airport (TSAIA) currently rely on the local utility grid to meet their electrical demands, with backup power sources available for critical operations. The primary renewable energy technology under consideration is photovoltaic (PV). However, we are exploring additional technologies to support the PV array, including electrical heating, energy storage solutions, and other complementary systems that can enhance overall energy efficiency and grid reliability.

These technologies are being explored to reduce grid dependence, improve sustainability, and potentially sell surplus power back to Chugach Electric Association (CEA) and Golden Valley Electric Association (GVEA). This would leverage Alaska's net metering policies, which allow for compensation of excess energy exported to the grid under certain conditions.

Installing and integrating a solar array involves close coordination with the local utilities to meet specific interconnection standards and to conduct grid impact studies. These studies are essential to ensure that the energy exported does not disrupt power quality and that the integration complies with all necessary regulations.

FAA Safety and Regulatory Requirements. FAA regulations play a significant role in determining the feasibility of airport solar installations. One critical requirement is the submission of an approval report that includes a detailed glare analysis to ensure there is no risk to pilots and air traffic controllers. Compliance with 14 CFR Part 77, which governs airspace penetrations and ensures the safe operation of aircraft, is also necessary. The glare

analysis must use the FAA-approved Solar Glare Hazard Analysis Tool (SGHAT), which evaluates potential reflections and mitigates any interference with flight operations. The Anchorage International Airport has obtained approval from FAA for select airfield sites; the Glare Hazard Analysis for two sites are includes as Attachments to this RFI.

Land Selection. Non-aeronautical land at both airports has been identified as potential sites for solar development. These include ground-mounted installations in open, unused areas, as well as innovative concepts such as solar canopies over parking lots or panels mounted on the roofs and walls of existing structures. Rooftop installations may provide a dual-purpose use of space but are not as cost effective as a ground mounted system which would allow for larger-scale energy production. DOT&PF is currently open to multiple options.

Alaska International Airport System

The Alaska International Airport System - comprising TSAIA and FIA is home to over 30 international and domestic airlines providing passenger and cargo service throughout Alaska, the United States, Europe, and Asia. It's also an extraordinary economic engine; serving nearly 6 million passengers per year and accounting for 1 in 7 and 1 in 20 jobs in Anchorage and Fairbanks, respectively.

Ted Stevens Anchorage International Airport (TSAIA)

TSAIA is Alaska's largest airport, serving as a critical hub for both passenger and cargo traffic. Located in Anchorage, TSAIA is the primary gateway to Alaska and a significant global cargo hub, strategically positioned on international trade routes between Asia and North America. The airport handles over 5 million passengers and nearly 3 million tons of cargo annually, making it one of the busiest cargo airports in the world.

TSAIA offers a range of services, including multiple passenger airlines, cargo logistics, and essential support for military and aviation industries. The airport is a critical piece of Alaska's transportation infrastructure, contributing significantly to the state's economy.

Fairbanks International Airport (FIA)

FIA serves as the primary air transportation hub for Interior Alaska and provides vital connectivity to both rural communities and international destinations. Located in Fairbanks, it supports approximately 1 million passengers annually and handles a significant amount of cargo, including essential goods for remote regions.

FIA is an important link for tourism, military, and commercial air services, offering year-round operations. The airport’s strategic location supports operations in cold climates, making it a crucial asset for regional and international travel, as well as a key hub for Arctic research and logistics.
Both airports play a pivotal role in connecting Alaska to the world while supporting the state’s economy through tourism, cargo, and critical transportation services.

Supporting Data:

To aid in preparing responses, DOT&PF has provided the following information in Attachments A and B (FIA) and C and D (TSAIA):

Power Supply and Grid Connection

- **Annual Electricity Consumption**: Total energy use for each airport over the past year.
- **Monthly Peak Demand**: The highest electrical demand in kilowatts (kW) recorded each month.
- **Monthly Load Profile**: Energy consumption monthly trends for optimizing solar system sizing.
- **Monthly Utility Bills**: Historical utility costs, which should be factored into savings estimates.
- **Electricity Tariff Information**: Including rates, demand charges, and time-of-use pricing structures.

- **Interconnection Agreements**: Existing agreements with utility providers outlining the terms for connecting to the grid.
- **Backup Power Sources**: Information on backup systems in place to ensure uninterrupted power supply.
- **Net Metering**: Details on policies that allow surplus solar energy to be sold back to the grid.

Heating System Information

- **Current Heating Systems**: Overview of technologies in use at the airports.
- **System Efficiency**: Data on the performance of existing heating systems.
- **Age and Condition**: Details on the lifespan and current state of heating equipment.
- **Backup Systems:** Information on backup heating systems in place.
- **Annual Heating Energy Consumption:** Total annual energy used for heating.
- **Peak Heating Loads**: Maximum heating demand recorded during peak periods.
- **Heating Load Profile**: Trends in heating demand over time.

Submission Information:

The primary focus of this RFI is the installation of a photovoltaic (PV) array; however, we are also evaluating additional technologies that can complement and enhance the PV system. Consider addressing the following options, offering technical and economic insights into their integration with the PV system, particularly for cold climate applications at TSAIA and FIA.

Given that the provided load profiles for TSAIA and FIA are insufficient for detailed modeling, DOT&PF requests that respondents complete the information as much as possible. Where specific data is unavailable, please clearly list the assumptions used to fill those gaps. In areas where data is lacking, conceptual information is encouraged to demonstrate your understanding of key topics and to highlight your company's expertise and capacity. Artificial load profiles may be required to supplement the missing data.

Proposers are required to provide a detailed technical approach outlining the integration of PV systems into AIAS operations. The approach must address:

Company Profile

- **Company Overview**: Provide company name, contact details, and primary point of contact.
- **Relevant Experience**: Summarize your experience in solar energy projects, with a focus on projects in cold climates or harsh environments (e.g., Arctic, subarctic, or high-wind regions).
- **Past Performance**: Include specific examples of completed projects of a similar scale, particularly those with complex environmental or operational challenges.

Technical Approach. Evaluate the feasibility of integrating PV systems to support various airport applications, considering system performance in cold climates and integration with existing infrastructure. Analyze overall energy demand across operational areas to determine how solar can offset energy costs and improve efficiency. If beneficial, assess potential energy storage solutions, such as battery systems, to enhance energy resilience, manage fluctuating demands, and provide backup power for critical operations. Finally, identify essential ancillary components—such as inverters, transformers, SCADA systems, and electrical switchgear—ensuring their compatibility with the existing grid, scalability for future expansion, and compliance with electrical standards.

System Specifications. Provide information for a 10MW PV system at TSAIA and FIA with potential. Response are recommended to include:

- **System Capacity & Power Output:** Define the system size, expected power generation, and energy yield.
- **Panel Efficiency & Degradation:** Specify solar panel type and performance under Arctic conditions.

- **Tilt Angle & Orientation:** Optimize for latitude-specific solar capture.
- **Ground Coverage Ratio:** Address shading and spacing between rows.
- **Balance of System (BOS) Components:** Include inverters, wiring, and transformers.
- **Energy Storage Integration:** Discuss storage solutions for peak demand and grid resilience.
- **Cold Climate Adaptation**: Include considerations for snow load capacity, wind resistance, limited daylight, and extreme temperature performance.
- **Integration with Heating Systems:** Discuss incorporating solar thermal or electric heating for specific uses like hangar and terminal heating.

Grid Interconnection and Net Metering. Outline the strategy for connecting the PV system to the electrical grid, ensuring compliance with interconnection requirements and maintaining grid stability. Additionally, provide a plan to optimize financial returns through Alaska's net metering policies, including the sale of surplus energy.

Business Model and Financing. Propose business models for the project, exploring options such as Power Purchase Agreements (PPA), direct investment, or leasing. Provide cost estimates, including CAPEX, OPEX, payback periods, and projected financial returns, while factoring in available federal and state incentives. Additionally, identify any relevant grants or funding opportunities that could enhance the project's financial viability.

Operations and Maintenance (O&M). Develop a comprehensive O&M plan that includes maintenance strategies tailored for Arctic conditions, such as snow removal, system upkeep, and remote monitoring capabilities. Clearly define the expected lifecycle of major components, such as inverters, PV modules, and energy storage systems, and provide detailed information on warranties for each component to ensure long-term reliability and performance.

Regulations and Permits. Provide a regulatory and permitting strategy that outlines compliance with FAA requirements for airport solar installations, addressing issues such as glare, radar interference, and air traffic impacts. Additionally, include a plan for securing utility interconnection agreements and managing net metering to ensure smooth integration with the grid and adherence to local regulations.

Timeline. Include a detailed project timeline with key milestones for design, permitting, installation, and operation.

Additional Considerations. Outline potential partnerships with local contractors, suppliers, and stakeholders to support project development. Propose workforce development strategies, including training and certification programs for local technicians in solar technology. Additionally, offer value-added proposals, such as innovative energy management systems, grid independence solutions, or pilot programs for emerging technologies to enhance the project’s overall impact and sustainability.

Potential Assumptions:

Responses are recommended to include:

Assumption	Details
PV Array Size	Assume a 10kW PV array for modeling purposes.
Land Acquisition	No land acquisition costs.
Energy Rates	Flat energy rate throughout the project life.
Utility Costs	Exclude costs for transformers, substations, or utility infrastructure.

Construction Date	Assume construction begins in 2025.
Load Profiles	Where profiles are lacking, provide conceptual or artificially generated profiles, clearly listing any assumptions.
Location Data	Use available data to model solar radiation and other relevant environmental factors.

Submission Requirements:

Proposals should be no more than 10 pages in length and should include each of the following sections: Company Profile, Technical Approach, System Specifications, Grid Interconnection and Net Metering, Business Model and Financing, Operations and Maintenance (O&M), Regulations and Permits, and Timeline.

Submittals must be received by November 1, 2024, at 4:00 pm Alaska Time. All proposals should be submitted electronically to chris.hunt@alaska.gov

Questions concerning this RFI should be directed in writing to:
Chris Hunt
Procurement Officer
Email: chris.hunt@alaska.gov

This RFI is for informational purposes only. The State of Alaska is not obligated to pursue any specific project or contract as a result of this RFI. This request does not constitute a commitment by the State to award any contracts or procure any services. Information gathered may be used to shape future solicitations and project designs.

Attachment A – FIA Electrical Demand Overview

Current Energy Consumption Data

Service Provider	Annual Electricity Consumption	Annual Cost (FY24)	Peak Demand (January 2024)	Demand Charge (Percentage of Total Cost)
Golden Valley Electric Association (GVEA)	4,860,780 kWh	$1,197,163	556,180 kWh	26%

Electricity Tariff Information

Tariff Component	Rate (FY24)
Average Cost per kWh	$0.047
Utility Charge (per kWh)	$0.047
Demand Charge (per kW)	$23.4
Fuel & Purchased Power Charge (per kWh)	$0.1
Regulatory Cost Charge (per kWh)	$0.001
Electric Reliability Organization (ERO) Surcharge (per kWh)	$0.0007

Demand Charge Structure

Rate Class	Details
Applicable Rate Classes	GS2 and GS3 (business/industrial)
Demand Charge Calculation	Based on the highest average rate of energy use over any 15-minute period within the billing cycle. Billed per kW.

Power Supply and Grid Connection

Item	Details
Interconnection Agreement	Standard service connections provided by GVEA. Possible NR construction agreement for service applications submitted prior to service connection.
Backup Power Sources	- Passenger Terminal: 500kW diesel generator - Airport Response Center: 230kW diesel generator - Airfield Lighting Regulator Building: 1x350kW & 1x300kW diesel generators (alternating duty cycles)

Net Metering Options

Item	Details
Eligibility	Must work with GVEA to determine commercial net metering options. GVEA's current SNAP program allows projects up to 25 kW for net metering.

Technical Notes and Considerations

- **Peak Demand**: January 2024 saw the highest recorded demand, critical for sizing solar PV and potential energy storage systems to help reduce peak demand and related charges.

- **Demand Charges**: Demand charges are calculated based on the highest 15-minute energy use within a billing cycle. Solar PV combined with energy storage could help mitigate these charges by lowering peak demand.
- **Backup Power**: Diesel generators currently provide backup power for critical systems. Solar PV with storage could reduce reliance on these generators during outages or peak demand periods, improving sustainability.
- **Net Metering**: GVEA's net metering program currently supports projects up to 25 kW. Commercial systems larger than this may need specialized agreements or modifications to access net metering benefits.

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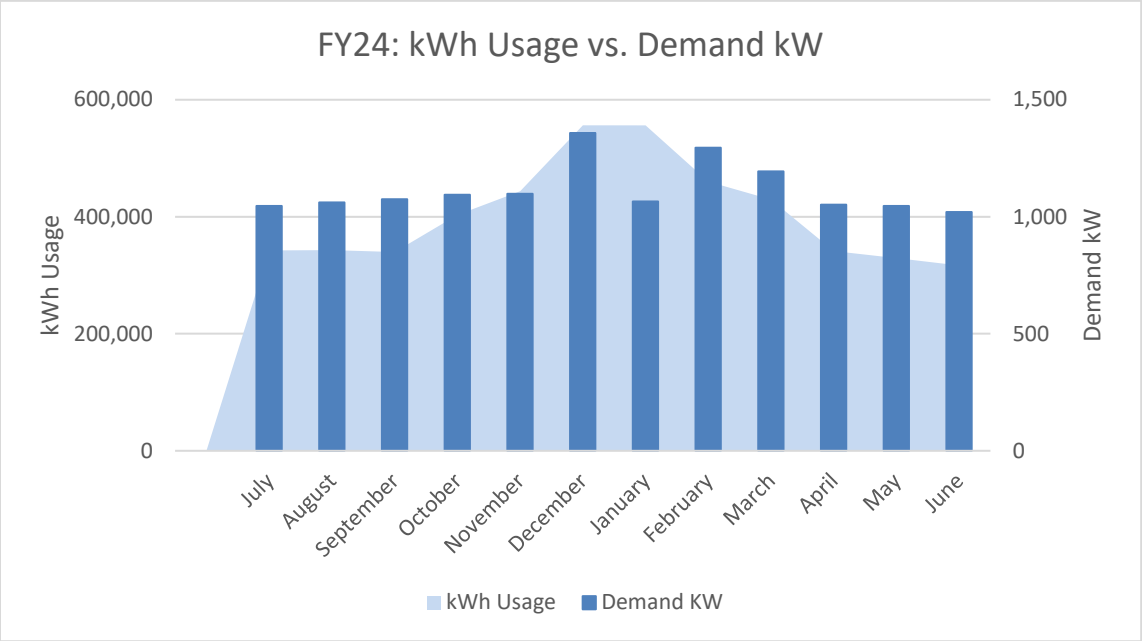
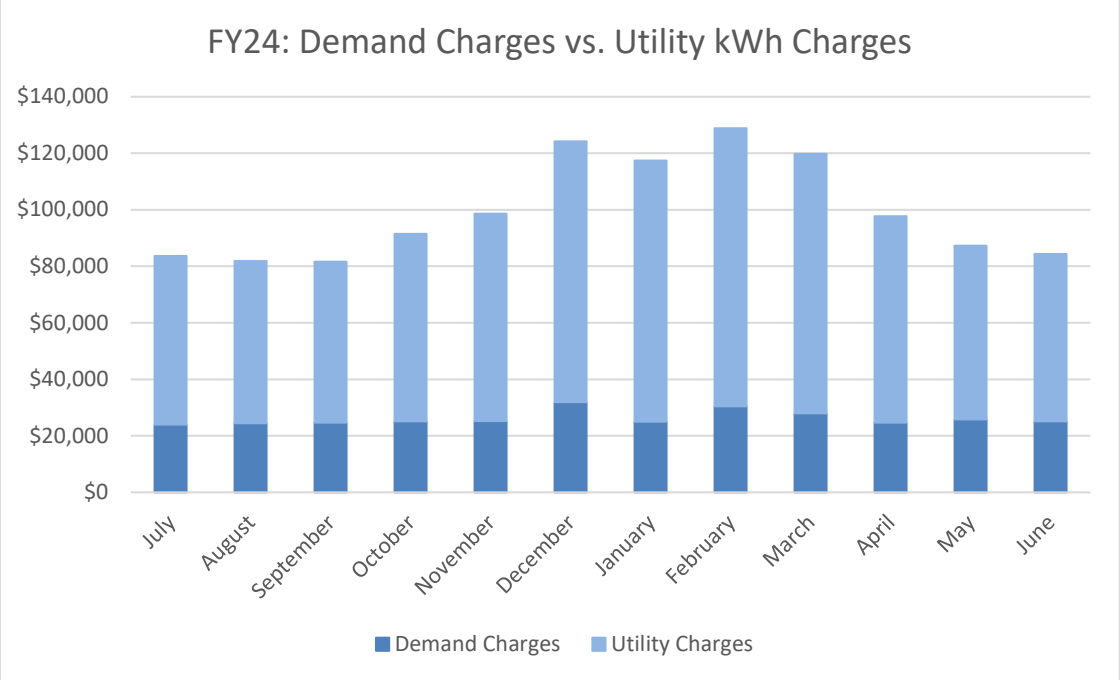
FIA Electrical Load Profiles





Attachment B – Fairbanks International Airport (FIA) Heating Demand Overview

Heating Energy Consumption

Service Provider	Annual Consumption (FY24)	Annual Cost (FY24)
Crowley Fuels Alaska (Heating Fuel)	33,310 gallons	$108,930
Interior Gas Utility (Natural Gas)	189,223 CCF (hundred cubic feet)	$443,521

Peak Heating Loads (January 2024)

Fuel Type	Peak Consumption
Heating Fuel	6,282 gallons
Natural Gas	36,346 CCF

Existing Heating Systems

Building	Heating System	Efficiency	Age & Condition
Passenger Terminal	3 natural gas boilers, with AHU	84%	Installed 2009, fair to good
Airport Response Center	2 natural gas condensing boilers, with AHU	95.7%	Installed 2013, fair to good
Airport Maintenance Facility	2 heating fuel boilers, with AHU	85.6%	Installed 2003, fair
Sand Shed	1 natural gas boiler, with AHU (primarily for sand drying)	95%	Installed 2012, good condition
Regulator Building	Electric heat with AHU (AHU used only for cooling)	N/A	N/A (Electric heating system)

Backup Systems

Building	Backup Heating System
Passenger Terminal	1 heating fuel backup boiler
Airport Response Center	Lead/lag boiler system (one serves as backup)
Airport Maintenance Facility	Lead/lag boiler system (one serves as backup)
Sand Shed	No backup system
Regulator Building	No backup system currently

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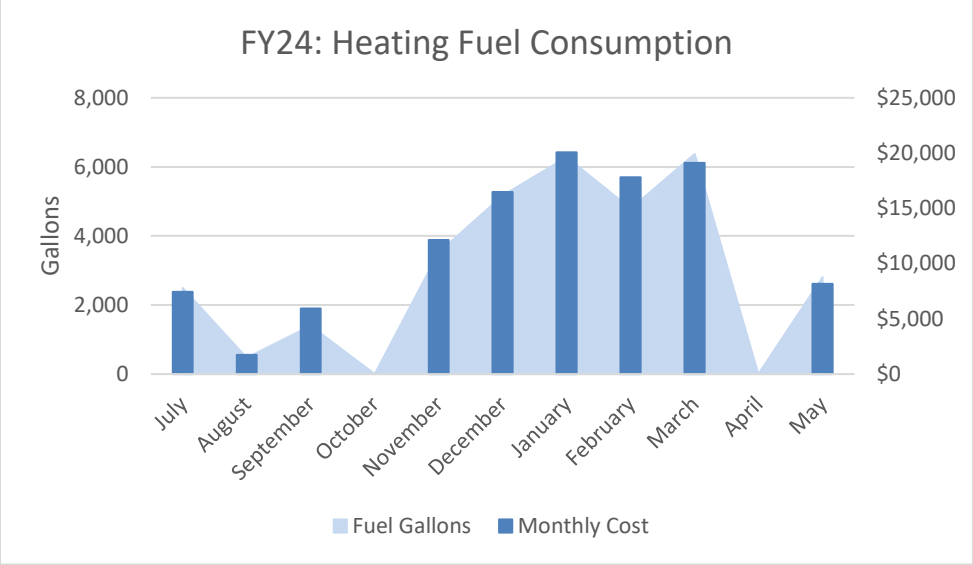
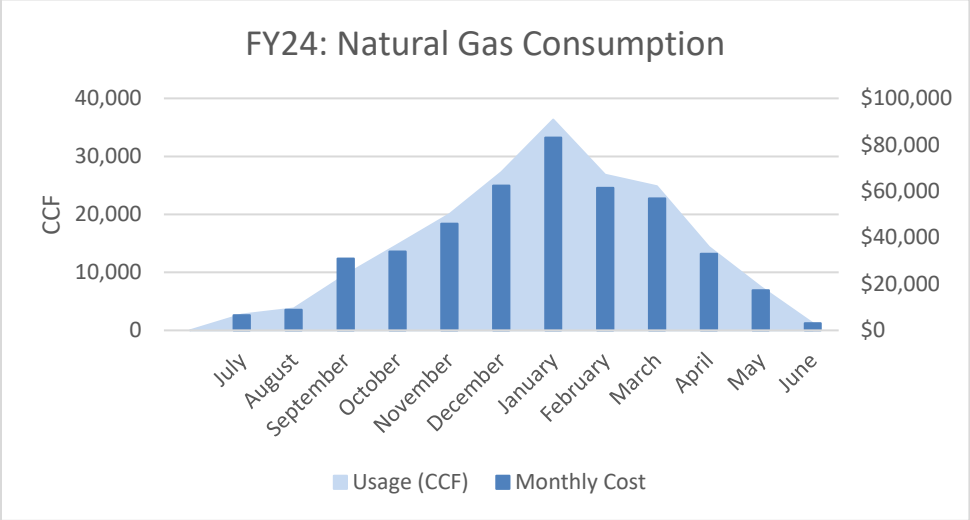
FIA Heating System Profile





Attachment C – TSAIA Electrical Demand Overview

Current Energy Consumption Data

Item	Details
Service Provider	Chugach Electrical Association
Annual Electricity Consumption (FY24)	25,528,800 kWh (North Terminal + South Terminal)
Annual Electricity Cost (FY24)	$4,218,815
Demand Charges (FY24)	$971,454
Percentage of Cost in Demand Charges	23.0%
Peak Demand (Aug 2023)	2,371,200 kWh

Electricity Tariff Information

Rate Component	Cost
Average Cost per kWh (FY24)	$0.050
Utility Charge (kWh)	$0.047
Demand Charge	$22.73 per kW
Fuel & Purchased Power Charge	$0.055 per kWh
Regulatory Cost Charge	$0.0010 per kWh
Electric Reliability Organization (ERO) Surcharge	$0.0009 per kWh

Demand Charge Structure

Rate Class	Details
Demand Calculation	Demand is calculated based on the highest average rate of energy use during any 15-minute period within the billing cycle. This demand charge is billed per kilowatt in addition to the standard energy usage charge.

Power Supply and Grid Connection

Item	Details
Interconnection Agreement	TSAIA is billed using standard small and large commercial service agreements with Chugach Electrical Association.
Backup Power Sources	Total 6.8 MW combined facility-wide power production ability: - South Passenger Terminal: 2x 900 kW diesel generators - North Passenger Terminal: 1x 400 kW and 1x 220 kW diesel generators - Airfield: 1x 600 kW diesel generator

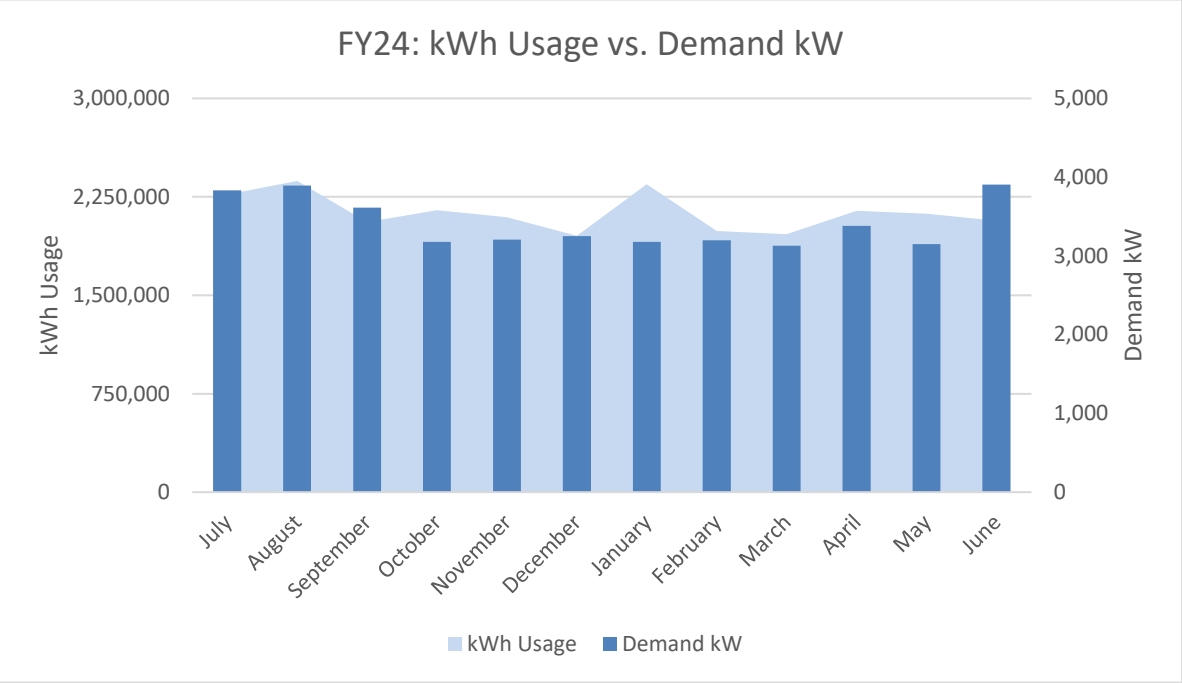
Net Metering Options

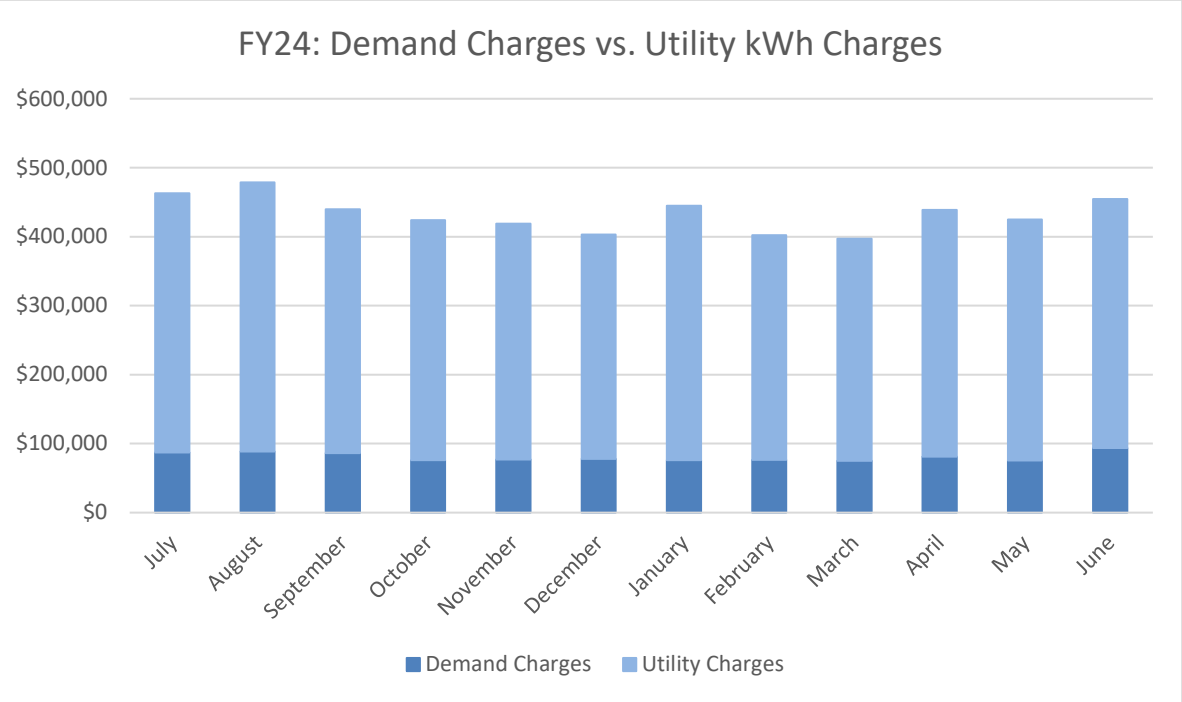
Item	Details
Net Metering Eligibility	Chugach Electrical Association offers net metering based on service type and alternate energy sources. Currently, TSAIA has no requirement for interconnection or net metering.

Technical Notes and Considerations

- **Peak Demand**: The peak demand in August 2023 represents the highest energy consumption period, which is crucial for designing solar PV and energy storage systems to mitigate peak demand and related costs.
- **Demand Charge Structure**: The demand charge is based on the highest 15-minute usage period each month, making it a key target for solar PV and storage solutions aimed at reducing peak loads and lowering costs.
- **Backup Power**: TSAIA has significant diesel generator backup power across its terminals and airfield. Solar PV and energy storage could complement these generators, providing a more sustainable solution during outages or peak load periods.
- **Net Metering**: While Chugach Electrical Association offers net metering options, TSAIA currently does not utilize interconnection or net metering. This could be explored for future solar PV integration and surplus energy export.

TSAIA Electrical Load Profile




FY24: Demand Charges vs. Utility kWh Charges
$600,000
$500,000
$400,000
$300,000
$200,000
$100,000
$0
July
August
September
October
November
December
January
February
March
April
May
June
Demand Charges
Utility Charges

Appendix D – TSAIA Heating System Information

Heating System Overview – TSAIA

Item	Details
January 2024 Peak Demand	161,571 CCF natural gas
Heating System Type (South Terminal)	6 sectional dual-fuel boilers (natural gas and diesel)
Heating System Type (North Terminal)	4 sectional natural gas boilers

System Efficiency

Terminal	Efficiency
South Passenger Terminal	82.3%
North Passenger Terminal	81.7%

Age and Condition of Heating Systems

Terminal	Installation Year	Condition
South Passenger Terminal	2004	Fair condition
North Passenger Terminal	1982	Serviceable but obsolete; replacement parts are not available

Backup Systems

Terminal	Backup Capability
South Passenger Terminal	Dual-fuel capabilities (natural gas and diesel)
North Passenger Terminal	No backup capabilities

Technical Notes and Considerations

- **Peak Natural Gas Demand:** January 2024 shows a peak demand of 161,571 CCF of natural gas, which is an important factor when sizing any potential energy-saving measures or supplementary systems such as solar PV or energy storage.
- **System Efficiency:** Both terminals have moderately efficient heating systems; however, given the age of the systems, particularly in the North Terminal, improvements in efficiency could be achieved through modernization or alternative energy integration.
- **Age and Obsolescence:** The North Terminal's heating system is outdated, installed in 1982, and is considered obsolete due to a lack of available replacement parts. This presents a key opportunity for system upgrades, potentially integrating newer, more efficient technologies.
- **Backup Systems:** The South Terminal benefits from dual-fuel backup capabilities (natural gas and diesel), providing some redundancy in case of fuel shortages or supply issues. However, the North Terminal has no backup system, leaving it vulnerable to potential heating disruptions.

Natural Gas Consumption Profile